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Students First

A Guide for Students

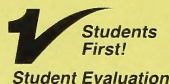
Preparing to Write
the Science 30
Diploma Examination

Preparing to Write the Science 30 Diploma Exam

Dear Student:

The authors of this guide are staff from the Student Evaluation Branch. These are the people who actually put together the exam you will be writing. They also organize the marking sessions and train the teachers who mark the exams. These people see first-hand what thousands of students are doing right (and wrong) when they write an exam.

This guide and all other diploma exam-related materials produced by Student Evaluation Branch staff are identified with the logos



I hope you will find this guide helpful. Good luck on exam day!

*Frank Horvath, Director
Student Evaluation Branch*

Getting ready

✓ Start now

The most effective way to prepare to write the Science 30 Diploma Exam is to continue developing critical-thinking and scientific-inquiry skills throughout the course. Try to find applications in your daily life and in the technology that surrounds you for each topic you study. Take the time to read scientific articles and to relate them to your learning.

Become familiar with the data booklet and how it is arranged. One of the desired outcomes of the Science 30 course is for students to be able to use scientific information presented in data tables and booklets in a “scientifically literate” manner. It should be possible to find data by using unfamiliar sources and to use the data to solve a problem.

Practice writing essay and position papers for at least one major technology in each unit of study. It is important to know the scientific principles involved in each technology and to understand how the various technologies impact on the environment and on society.

✓ **Understand the machine-scored section of the exam**

The Science 30 exam consists of two parts. The first part of the exam is machine-scored and consists of 44 multiple-choice questions and 12 numerical-response questions, each with a value of one mark. The exam contains sets of questions that relate to a context or scenario. This helps to integrate questions from all units of the course. The context will appear on a screened background.

A set may contain multiple-choice and/or numerical-response questions.

In some cases, these items are “linked.” This means that an answer from one question may be needed to complete the calculations in the next question. If you answer the first question incorrectly but use that answer correctly to answer the second question, you will receive full marks for the second question. Ask your teacher to show you examples of these types of questions.

✓ **Understand the written-response**

The second part of each Science 30 exam consists of two written-response questions, each worth 15% of the examination mark. The first question is a skill-based question where students must demonstrate their ability to design and analyze scientific studies.

The next written-response question has a science, technology, and society (STS) emphasis. This question is designed to allow you to communicate what you know about science and technology and how it affects society. You may be asked to give an informed opinion as to how you think the technology should be used in the future.

Each of the written-response questions is marked by two Science 30 teachers, using scoring guides that have been developed from the ones that appear on pages 12 and 13 in your data booklet.

Samples of both types of written-response questions and the corresponding scoring guides are in the *Science 30 Information Bulletin, Diploma Examinations Program*, which is available from your teacher.

✓ **Understand the calculator policy and examination rules**

The Calculator Policy can be found in the *Science 30 Information Bulletin, Diploma Examinations Program*. Read it carefully. Students are expected to use a scientific calculator when writing diploma examinations in mathematics and science. Calculator memories must be cleared of all stored information, except for formulas that appear on the data tear-out pages or in the data booklets and programs that are used for graphing quadratic relations in Math 30/33. It is your responsibility to ensure that

there is no information stored in the calculator you are using except what is specifically allowed by the policy. Failure to do this is a breach of exam rules and is considered cheating. It is not worth taking a chance. If you are unfamiliar with how to clear calculator memories, talk to your teacher.

What you can do to prepare

✓ Prepare a review schedule

- Make a study checklist of everything you need to know for the exam so you can cross off items as you review them
- Design your schedule for the two-week period (minimum) before the examination
- Review your material frequently, but keep your sessions short. Change tasks (or subjects) every hour to maximize your ability to concentrate
- Divide the course material into sections and indicate on the schedule the time blocks to be devoted to each section
 - take into account the examination review specifications contained in the *Science 30 Information Bulletin*. Note that course units are not equally weighted on the diploma examination
 - take into account units/concepts that you find most difficult; i.e. allocate more time for the review of these

✓ Review schedules, rules, and policies

- Record the time and place of writing
- Note minimum and maximum writing times permitted
- Prepare to remain in the examination room for at least 2.5 h (Kleenex, cough drops, etc.)
- Identify materials allowed for writing each examination, such as pencils, pens, calculators, mathematical instruments, and a clear plastic ruler
- Review the Examination Rules available from your teacher or principal (Appendix B of the *General Information Bulletin*)
- Review the Calculator Policy (Appendix A of the *Science 30 Information Bulletin*)
- Review the Guidelines for Significant Digits, Manipulation of Data, and Rounding in Mathematics (Appendix C of the *Science 30 Information Bulletin*)

✓ Find examples of each type of question

- Review sample questions contained in the *Science 30 Information Bulletin*
- Review previous diploma examinations (available from your teacher)
- Learn the meanings of key “directing” words (Appendix A)
- Learn the meaning of key “science process” words (Appendix B)

- ✓ **Develop memory aids**
 - Colour code, underline, highlight, jot key words in margins; use flashcards, checklists, outlines, or summaries
 - Number points to be memorized
 - Group word and idea associations
 - Read key words aloud, express key words in your own words

- ✓ **Make summaries and outlines**
 - Distinguish between major concepts and factual details
 - Identify essential skills that can be assessed on paper and pencil tests
 - Review lab results and procedures—identify connections between lab reports, class notes, and textbook
 - Anticipate examples of connections between concepts and the “real world”
 - Prepare a glossary of important subject terminology
 - Review the data booklet for Science 30. Know where to find formulas and other data that may be relevant to a particular question
 - Link each formula with a calculation done on a previous test or assignment
 - Identify any restriction on the use of each formula

- ✓ **Organize a study group**
 - Arrange for a group of up to five dedicated students to study together several nights before exam day. Set an agenda to avoid wasting time. List material to be reviewed so all members can be prepared. Compare notes and resources to help determine what may appear on the exam. Members should share academic goals and be there to provide support and encouragement.

How to do your best when writing the exam

- ✓ **Be comfortable**
 - Make yourself comfortable. Wear comfortable clothes, eat well, and get plenty of rest.

- ✓ **Be prepared**
 - Arrive a few minutes early and check that you have all necessary supplies. A spare calculator is not a bad idea. Make sure you’ve cleared your calculator memories of all information except what is specifically allowed in the Calculator Policy.

- ✓ **Pace yourself**
 - Keep track of the time and pace yourself. Put a mark by items that you are uncertain about and return to them if there is time at the end of the examination.

- ✓ **Answer every question**
 - Do not be afraid to answer each question even if you are not sure of the correct solution to the problem. A penalty is NOT given for guessing on the machine-scored section the exam. Partial marks are often awarded for incomplete answers in the written-response section of the exam.
- ✓ **Use logical guessing**
 - If you are stuck on a question, mark the alternatives that you know are incorrect and choose from the ones that are left, using logical guessing strategy. Think of the questions as challenges and cultivate a positive attitude about your ability to answer them.
- ✓ **Testwise tips**
 - Be careful NOT to rely on common testwise tips such as choosing the longest answer, choosing a middle number for a calculation, or when two answers are similar, deciding that the answer must be one of the two. Exam managers try to ensure that these “tips” do not give testwise students an advantage.
- ✓ **Look over the entire exam**
 - Scan the sets of questions on the examination before answering a particular question. The questions in one set of the examination may jog your memory about a question in another set.
- ✓ **Identify key words**
 - When first reading a multiple-choice question, locate and circle key words to help clarify the meaning of the question. Then, hide the alternatives and try to formulate an answer of your own. Your answer may be very close to the correct alternative.
- ✓ **Do calculations first**
 - If a multiple-choice question involves a calculation, do the calculation and select the alternative that is closest to your answer. A multiple-choice calculation is usually short. If you cannot do it in five minutes, your method is either inappropriate or incorrect. Go on.
- ✓ **Label diagrams**
 - Diagrams on examinations are often labelled with numbers or letters. It may be useful to jot down the names of the labelled structures or features that you can identify.
- ✓ **Use a clear ruler**
 - When reading graphs, use a clear plastic ruler to more accurately extrapolate or interpolate data.

- ✓ **Don't look for patterns**
 - Have a good reason for changing an answer. Do not change an answer on a hunch. Do not waste your time looking for patterns of As, Bs, Cs, or Ds in multiple-choice answers. There are none.
- ✓ **Fill in answers carefully**
 - Make sure that the number of the question you are answering corresponds to the number on the answer sheet.
- ✓ **Read the question carefully and do what is asked of you**
 - It is well worth your time to carefully read all the instructions and information provided. By using a highlighter pen to emphasize key words, you can focus clearly on the task you must complete.
- ✓ **Plan your writing**
 - Space for planning is provided to help you organize your work. Use it! Successful writers usually take the time to plan what they will say by using a variety of planning techniques, such as preparing an outline, listing ideas, or drawing a web diagram. Use the method with which you are most comfortable.
- ✓ **Stay focused**
 - As you write, keep checking to ensure that you remain focused on the assigned task. Don't let one idea lead you to another that is not related to your topic.
- ✓ **Support your ideas**
 - The written-response questions may require you to present and support ideas. The most convincing and informative pieces of writing include support (illustrations, examples, facts) for the ideas that are being presented. Support could also include tables, graphs, or chemical equations.
- ✓ **Think about your reader**
 - Your writing will be marked by Science 30 teachers. Your job is to express your ideas clearly. You must help your reader to understand your ideas by giving examples that are accurate and related to your topic. Show your reader why you are thinking as you are.
- ✓ **Be careful when using the information contained in the exam**
 - You are encouraged to use information provided within the exam to help you complete your written response—but be careful. Multiple-choice questions contain wrong as well as right answers. If you choose to use information provided in a wrong answer, you will weaken your writing. If you are unsure about the correctness of some information, it is best to choose another example.

✓ **Reread your work**

- When marks are awarded, consideration is given to the clarity and correctness of your writing, as well as to what you say. So, be sure to take some time to reread your writing carefully. Use a pen and write neatly. The markers will be able to concentrate on what you said in your written response, instead of thinking about how difficult it is to read.

Additional reminders

✓ **Further information**

For more detailed information about the Chemistry 30 diploma examination, ask your teacher about a booklet from Alberta Education called the *Chemistry 30 Information Bulletin, Diploma Examination Program*. Each Chemistry 30 teacher will have a copy.

This bulletin contains a great deal of information about the exam as well as the scoring criteria used by markers to evaluate your written work.

✓ **Rescores**

You may request a rescoring of your examination if you believe that the mark you have received is not appropriate. Before applying for a rescoring, be sure to check your *Diploma Examination Results Statement* to see what marks you have been awarded on each section of the exam. Your mark on the machine-scored portion is not likely to change, but your written-response mark could change slightly. Keep in mind that if you do request a rescoring, your new mark, whether it increases *or decreases*, will be your final mark. The fee for this service is \$26.75, which includes G.S.T. This fee is refunded if your mark changes by more than 5%.

✓ **Rewrites**

You may rewrite a diploma examination in any regularly scheduled exam period. You must apply to the *Student Evaluation Branch* by November 15 and April 15 to be eligible to write the January and June diploma examinations. The fee for rewriting each exam is \$26.75, which includes G.S.T. If you wish to rewrite in August, you may register and pay the fee at any designated writing centre on the day of the exam. (For more details, see the *General Information Bulletin*.)

✓ **Other questions**

If you have questions about the exam that your teacher can't answer, or if you are a student without a regular classroom teacher, feel free to call

Mr. John Drader, Science 30 Examination Manager
or

Mr. Phill Campbell, Assistant Director, Math/Science Diploma Exams
at 403-427-0010.

To call toll-free from outside of Edmonton, dial 310-0000.

Good Luck!

Appendix A

Science process words

- Hypothesis:** A single proposition intended as a possible explanation for an observed phenomenon; e.g., a possible cause for a specific effect
- Conclusion:** A proposition that summarizes the extent to which a hypothesis and/or a theory has been supported or contradicted by the evidence
- Experiment:** A set of manipulations and/or specific observations of nature that allow the testing of hypotheses and/or generalizations
- Variables:** Conditions that can change in an experiment. Variables in experiments are categorized as:
- *manipulated variables* (independent variables)—conditions that were deliberately changed by the experimenter
 - *controlled variables* (fixed or restrained variables)—conditions that could have changed but did not, because of the intervention of the experimenter
 - *responding variables* (dependent variables)—conditions that changed in response to the change in the manipulated variables
- Technology:** The development of our understanding of science is directly related to the development of technology. The meaning of technology has many facets, but in general, technology refers to a way of doing something. This includes the development of tools and new techniques for solving problems. It also includes ideas and their organization for achieving practical purposes. In the context of an examination question, technology includes both these facets of meaning. That is, a technological explanation should include not only identification and descriptions of equipment (tools, products) but also explanations of procedures.

Appendix B

Directing words

Contrast/Distinguish

Point out the *differences* between two things that have similar or comparable natures

Compare

Examine the character or qualities of two things by providing characteristics of both that point out their mutual *similarities* and *differences*

Conclude

State a logical end based on reasoning and/or evidence

Criticize

Point out the *merits* and *demerits* of an item or issue

Define

Provide the essential qualities or meaning of a word or concept; make distinct and clear by marking out the limits

Describe

Give a written account or represent the characteristics of something by a figure, model, or picture

Design/Plan

Construct a plan, i.e., a detailed sequence of actions, for a specific purpose

Discuss

The word “discuss” will not be used as a directing word on math and science diploma examinations because it is not used consistently to mean a single activity

Enumerate

Specify one by one or list in concise form and according to some order

Evaluate

Give the significance or worth of something by identifying the good and bad points or the advantages and disadvantages

Explain

Make clear what is not immediately obvious or entirely known; give the cause of or reason for; make known in detail

How

Show in what manner or way, with what meaning

Hypothesize

Form a tentative proposition intended as a possible explanation for an observed phenomenon; i.e., a possible cause for a specific effect. The proposition should be testable logically and/or empirically



Identify

Recognize and select as having the characteristics of something

Illustrate

Make clear by giving an example. The form of the example must be specified in the question; i.e., word description, sketch, or diagram

Infer

Form a generalization from sample data; arrive at a conclusion by reasoning from evidence

Interpret

Tell the meaning of something, present information in a new form that adds meaning to the original data

Justify/Show How

Show reasons for or give facts that support a position

Outline

Give, in an organized fashion, the essential parts of something. The form of the outline must be specified in the question; i.e., lists, flow charts, concept maps

Predict

Tell in advance on the basis of empirical evidence and/or logic

Prove

Establish the truth, validity, or genuineness of something by giving factual evidence or logical reasons

Relate

Show logical or causal connection between things

Solve

Give a solution for a problem; i.e., an explanation in words and/or numbers

Summarize

Give a brief account of the main points

Trace

Give a step-by-step description of the development

Why

Show the cause, reason, or purpose

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